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Docket No.: SON-2010
(80001-2010)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Hisao Hayashi et al.

Application No.: 09/772,986 | Confirmation No.: 2637

Filed: January 31, 2001 | Art Unit: 2811

For: THIN FILM SEMICONDUCTOR DEVICE, DISPLAY DEVICE USING SUCH THIN FILM SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF | Examiner: T. F. Tran

REPLY BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is a Reply Brief under 37 C.F.R. §41.41 in response to the Examiner's Answer mailed on May 14, 2008.

All arguments presented within the Appeal Brief of February 27, 2008 are incorporated herein by reference. Additional arguments are provided hereinbelow.

Claims 17-36 are currently pending in this application, with claim 17 being independent. No claims have been allowed.

Claims 17-27 and 36 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Japanese Publication No. 10-209467 to Hisao et al (Hisao).

Claims 28-32 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Japanese Publication No. 10-209467 to Hisao et al (Hisao) in view of U.S. Patent No. 5,912,506 to Colgan et al. (Colgan).

Claims 31-35 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Japanese Publication No. 10-209467 to Hisao et al (Hisao) in view of U.S. Patent No. 6,235,561 to Seiki et al. (Seiki).

Among others, the following positions were presented in the Examiner's Answer, each of which will be addressed in turn in this Reply Brief:

ARGUMENT

- **Page 8 of the Examiner's Answer contends that the specification clearly provides dimensions (a quantitative values) shown within the drawings. Specifically, page 8 of the Examiner's Answer urges that the drawing within Hisao clearly shows the structure which is claimed and should be relied upon to show the sizes of the gate electrode and the insulating film.**

In response, regarding the Figures of Hisao, it is well established under U.S. patent practice and procedures that *drawings do not* define the precise proportions of the elements and *may not* be relied on to show particular sizes *if the specification is completely* ***silent*** on the issue. *Hockerson-Halberstadt Inc. v. Avia Group International Inc.*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000). See M.P.E.P. §2125 (proportions of features in a drawing are not evidence of actual proportions when drawings are not drawn to scale).

Moreover, arguments based on the measurement of a drawing *are of little value absent any written description* in the specification of the quantitative values allegedly shown within the drawings. *In re Wright*, 569 F.2d 1124, 1127, 193 USPQ 332, 335 (CCPA 1977).

In this regard, Hisao arguably teaches an insulator layer 4 having a thickness of 100-200 nm (paragraph [0016]) and arguably teaches a thin film semiconductor device having a gate

electrode 5 having an upper layer 5a of 50-200 nm and a lower layer 5b of 50-200 nm (paragraph [0012]).

Here, Hisao arguably teaches overlapping ranges of thicknesses between the insulator layer 4, the upper layer 5a, and the lower layer 5b as shown hereinabove and noted in the Decision on Appeal at pages 8-9.

Yet, the Examiner's Answer ***fails*** to identify any written description in the specification of Hisao for the teaching that a thickness of the gate insulating film 4 ***being greater*** than a thickness of the gate electrode 5.

It is believed that this issue of the thickness of the gate insulating film 4 of Hisao being greater than a thickness of the gate electrode 5 has not been reached within the Decision on Appeal of June 28, 2007.

- **Page 9 of the Examiner's Answer contends that a person of ordinary skill in the art would have selected the smallest values for the gate insulating film and the gate electrode disclosed in Hisao in order to obtain a device as small as possible.**

In response to this contention, to have a reasonable expectation of success, one must be motivated ***to do more*** than merely to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the *prior art gave* either ***no indication*** of which parameters were critical or ***no direction*** as to which of many possible choices is likely to be successful. *Pfizer Inc. v. Apotex Inc.*, 82 USPQ2d 1321, 1333 (Fed. Cir. 2007).

Here, the Examiner's Answer ***fails*** to identify any written description in the specification of Hisao for the teaching that a thickness of the gate insulating film 4 ***being greater*** than a thickness of the gate electrode 5.

Moreover, the Examiner's Answer ***fails*** to identify any objective teaching that a person of ordinary skill in the art would have selected the smallest values for the gate insulating film and the gate electrode disclosed in Hisao in order to obtain a device as small as possible.

In this regard, the Examiner's Answer ***fails*** to highlight any objective teaching within the cited prior art to indicate which parameters within Hisao were critical or which of many possible choices within Hisao is likely to be successful.

But even if person of ordinary skill in the art would have selected the smallest values, note that Hisao arguably teaches the smallest value of the insulator layer 4 to be a thickness of **100 nm** (paragraph [0016]) and arguably teaches the smallest value of the upper layer 5a to be **50 nm** and the lower layer 5b to **50 nm** (paragraph [0012]). Applying simple arithmetic, the sum total of the smallest values for the upper and lower layers 5a, 5b of 50 nm + 50 nm = 100 nm. Note that 100 nm also ***equals*** the smallest value for the thickness of the insulator layer 4.

Thus, in applying the argument found on page 9, the Examiner's Answer ***fails*** to objectively show teaching within Hisao of a thickness of the gate insulating film 4 being ***greater*** than a thickness of the gate electrode 5.

- **Page 11 of the Examiner's Answer contends that no evidence of criticality of the claimed language has been provided.**

In response to this contention, "all evidence of nonobviousness must be considered when assessing patentability." *Richardson-Vicks Inc. v. The Upjohn Co.*, 44 USPQ2d 1181, 1186 (Fed. Cir. 1997).

"Consistent with the rule that *all evidence* of nonobviousness must be considered when assessing patentability, the PTO ***must consider comparative data in the specification*** in determining whether the claimed invention provides unexpected results." *In re Soni*, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995). See also, *In re Wright*, 6 USPQ2d 1959, 1962 (Fed. Cir. 1988).

Here, the specification as originally filed provides in the paragraph beginning on page 9, line 22, that:

> As the characteristic matter of this invention, the gate electrodes are comprised of metallic materials, whose thickness Tm is established with less than 100 nm. As the metallic materials, for instance, metals with high melting point can be adopted, selective from Mo (molybdenum), Ta (tantalum), Cr (chromium) or the like. According to this embodiment, Mo with thickness Tm of, for instance, 90 nm is used. The gate insulating film 4 covering the gate electrodes 5 is comprised of deposited film of, for instance, silicon dioxide (SiO_2), whose thickness Ti is established to be ***greater than*** the thickness Tm of the gate electrodes 5. By making the thickness Tm of the gate electrodes 5 to be less than 100 nm, thermal capacity can be reduced and the difference in thermal condition on the gate electrodes 5 and the insulating substrate 1 is made small, thereby trying to enlarge a process margin occurred by the laser anneal treatment. In this case, *if the thickness Ti of the gate insulating film 4 located between the gate electrodes 5 and the semiconductor thin film 2 is too thin, an effect of reducing the thickness Tm of the gate electrodes 5 is offset.* Therefore, *the thickness Ti of the gate insulating film 4 is made to become* ***greater than*** *the thickness Tm of the gate electrodes 5*. For instance, when the thickness Tm of the gate electrodes 5 is 90 nm, the thickness Ti of the gate insulating film is made to be 110 nm. The semiconductor thin film 2 deposited on the gate insulating film 4 is comprised of polycrystalline silicon crystallized by an irradiation of a laser beam. Its thickness is, for instance, 40 nm.

Thus, comparative data as evidence of unexpected results can be readily found within the specification as originally filed.

"An applicant relying on comparative tests to rebut a prima facie case of obviousness must compare his claimed invention to the closest prior art." *In re De Blauwe*, 222 USPQ 191, 196 (Fed. Cir. 1984).

The Examiner's Answer appears to identify Hisao as the closest cited prior art.

However, the Examiner's Answer fails to show within Hisao a criticality in the relationship between the thickness of the gate insulating film 4 and the thickness of the gate electrode 5a,5b.

Thus, the Examiner's Answer **fails** to show unexpectedly superior results within Hisao produced by the thickness of the gate insulating film 4 being ***greater than*** the thickness of the gate electrode 5a,5b.

- **No rebuttal can be found within the Examiner's Answer that Colgan fails to disclose, teach, or suggest the presence of a thin film semiconductor device wherein a thickness of said gate insulating film is greater than a thickness of said gate electrode.**

- **No rebuttal can be found within the Examiner's Answer that, Seiki fails to disclose, teach, or suggest the presence of a thin film semiconductor device wherein a thickness of said gate insulating film is greater than a thickness of said gate electrode.**

CONCLUSION

There is no concession as to the veracity of Official Notice, if taken in any Office Action. An affidavit or document should be provided in support of any Official Notice taken. 37 CFR 1.104(d)(2), MPEP § 2144.03. See also, *Ex parte Natale*, 11 USPQ2d 1222, 1227-1228 (Bd. Pat. App. & Int. 1989)(failure to provide any objective evidence to support the challenged use of Official Notice constitutes clear and reversible error).

For the foregoing reasons, all the claims now pending in the present application are allowable, and the present application is in condition for allowance.

The prior art of record fails to disclose, teach or suggest all the features of the claimed invention.

For at least the reasons set forth hereinabove, the rejection of the claimed invention should not be sustained.

Therefore, a reversal of the rejection of November 28, 2007 is respectfully requested.

If any additional fee is required or any overpayment made, the Commissioner is hereby authorized to charge the fee or credit the overpayment to Deposit Account # 18-0013.

Dated: July 10, 2008

Respectfully submitted,

By _____

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